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## **Food and Population under Subsistence Rice Farming in Three Villages in Yasothon, Northeast Thailand \***

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### **Abstract**

In all of three villages studied in Amphoe (District) Kham Khuan Kaeo, Changwat (Province) Yasothon, rice was cultivated almost exclusively for subsistence till the late 1970s. The paddy area per person showed a similar pattern of change from the 1920s in all three villages; it declined until hitting bottom a few decades ago, and remained little changed from then till the 1970s, although there are substantial inter-village differences in when it reached the bottom as well as in acreage per person at that level. The former reflects the length of village history: the earlier a village was founded, the earlier the per capita paddy area hit bottom. The latter reflects differences in the average yield of rice per unit area, which is largely determined by the soil and water conditions. The actual per capita rice supply remained at a similar level in all three villages till the late 1970s regardless of the varying area per person.

Rural-rural emigration (leaving one's village permanently for frontier lands elsewhere) and the reclamation of inferior land within villages were common till the early 1960s, being the only means to relieve population pressure. The former was more common in the oldest village, where the acreage per person shrank earliest. Temporary employment in off-farm jobs in urban areas, mostly in the Bangkok metropolitan area, began in the 1950s. In the late 1980s, the labor force engaged in temporary out-of-village jobs accounted for 10 to 16 percent of the village's total labor force. Permanent emigration to urban areas is also observed since the 1970s, and its frequency is roughly proportional to that of temporary emigration.

The existence in a village of uplands to grow cash crops such as kenaf and cassava appears to have had least effect on the rural-rural emigration but to have suppressed the temporary and, thence, permanent emigration to Bangkok.

In sum, the villages were able to accommodate increases in population as long as potential paddyland was available. Once it was exhausted, however, the excess population had to leave the villages. Till the early 1960s, most migrants made for frontier lands. The maintenance of self-sufficiency in rice thereafter should be attributed more to a likely decrease in the birth rate than to rural-urban migration. The principle of self-sufficiency in rice for those remaining in a village applied throughout the period under study, and the extra cash income either from upland farming or off-farm employment did not become an important determinant of the village population but contributed to the increased cash income.

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\* This paper was written based on two M.Sc. theses, by Somkiat Konchan and Nakada Yoshiaki, who conducted fieldworks in Yasothon under the supervision of Fukui Hayao in 1988 and 1989.

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## Introduction

The present study is primarily to examine the validity of the agroecological findings in DD village in Khon Kaen in other parts of Northeast Thailand which are similarly inhabited mainly by Thai-Lao people. DD village was studied by a large group of researchers of different disciplines in 1981 through 1984.<sup>1)</sup> Below, first, the agroecological findings at DD are briefly reviewed and, second, some features apparently relevant to agroecology in Yasothon are mentioned in comparison to those at DD.

### *A Review of the Agroecological Findings at DD*

DD was first settled by small groups of farmers who had migrated from the lower Chi River in the latter half of the 19th century. The arrival of migrating farmers continued through the 1920s. After a rather brief period, however, the direction of migration reversed; beginning in the 1940s, numerous villagers emigrated to make for frontier lands mostly on the upper Chi River. The spontaneous migration of farmers in small groups in search of paddylands is called *ha na di*, literally, to go in search of good paddylands. The *ha na di* emigration ceased toward the end of the 1970s. In its place, rural-urban migration became common, but the number of such migrants was less significant in DD than elsewhere because the city of Khon Kaen was rapidly growing and offering job opportunities to the villagers of DD, who could commute there daily.

Until the 1930s, the high mortality rate suppressed the rate of potential population increase to about two percent per annum, while the actual village population increased by about three percent per annum because of immigrating *ha na di* farmers. Subsequently, the rate of potential increase rose due to the declining mortality rate, reaching about three percent toward the end of the 1960s. The actual population, however, did not increase at such a high rate because of numerous *ha na di* emigrants during this period. From the 1970s, a declining birth rate as well as some rural-urban emigration helped stabilize the village population. In the 1980s, the observed rate of increase was less than one percent per annum.

By the 1930s, all of the low-lying good paddylands of DD had been reclaimed. During the 1940s, the higher lands on gentle slopes, which were less fertile and more susceptible to drought, were also turned to paddylands, and from the early 1950s the total paddy acreage remained unchanged. As of the early 1980s, no modern technology had been employed in rice-farming. The rice yield was low and extremely unstable and could be assumed not to have increased over the years, being determined largely by the inherent land conditions. Thus, the average yield of rice was probably better before the 1930s,

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1) Two books and many papers were published based on the DD village study. The agroecological aspects, however, are most extensively dealt with in [Fukui 1993].

when only the good lands were under the plough than after the 1950s, when the poor paddylands accounted for nearly one half of the total.

Until cotton, the first commercial crop in the village, was introduced during World War II, the village economy had been nearly completely of subsistence nature. Cotton was replaced by kenaf in the 1960s and the latter by cassava and vegetables in the 1970s. The most significant source of cash income from the late 1970s, however, was off-farm jobs. This cash income contributed greatly to improvement of the living standard.

From the beginning of this century till the early 1980s, DD was self-sufficient in rice in the long run. The extremely great variability in rice production, however, would have caused frequent shortages if rice had not been stored. Actually, the villagers seldom sold rice but stored as much of it as possible in order to cope with the great variability of production. Even so, the rice stock ran out once in a while. The probability of stock depletion in any given year was estimated to be 6/100 in the 1930s, and this rose to 17/100 from the 1960s. The degree of actual suffering from the depletion of rice stock, however, very much depended on the availability of cash income with which rice could be purchased. Thus, stock depletion meant starvation in the 1930s, when the village economy was largely of subsistence nature, though this recurred only two or three times in a lifetime. The higher probability since the 1960s, however, did not necessarily render greater hardship, because of the significantly increased opportunities to earn cash income. Actually, during the period of increasing probability of stock depletion, the living standard was improved greatly.

It appears that the villagers perceived two different accounts: the rice account and the cash account. Since rice was not commercialized in this village, there was no incentive to produce a surplus for sale. At the same time, no one stayed in the village if his holding of paddyland was too small to produce sufficient rice for home consumption. As a result, land fragmentation proceeded only up to a certain point, and self-sufficiency in rice was maintained. The cash account, on the contrary, determined the actual standard of living and was largely responsible for the intra-village income disparity. This does not say that there was no interaction between these two separate accounts. During the 1950s and 1960s, the increasingly favorable cash account affected the rice account in such a way that the villagers could tolerate a tighter balance of the latter. Yet it was also observed that the village population was basically still governed by the rice account. Further increase of cash income, however, would eventually free the village population from the rice account. Such was actually observed in the latter half of the 1980s. The proximity to the booming city of Khon Kaen was turning DD into a suburban village whose inhabitants included full-time wage earners.

#### *Yasothon in Comparison to DD*

The conditions relevant to agroecology that may differ substantially between DD and Yasothon include the following.

First, rainfall is more favorable in Yasothon than in DD. This implies that a smaller paddy acreage per person is required for self-sufficiency in rice in Yasothon, and that surplus production of rice may even be possible there.

Second, Changwat Yasothon offers very limited opportunities for off-farm jobs. Job opportunities in the adjacent two *changwat*, Roi Et and Ubon Ratchathani, which are 71 and 98 km away, respectively, are greater than in Yasothon, but no greater than in Khon Kaen. Therefore, the lifestyle dominant in DD, i.e., a relatively high living standard thanks to cash income and concurrent self-sufficiency in rice, might be difficult in Yasothon. In Yasothon, it is to be expected that more villagers will leave their villages for Bangkok for temporary as well as permanent off-farm jobs.

Third, if the general trend of Thai-Lao migration was such that the Chi River basin was settled from the lower to upper reaches beginning in the late 18th century, Yasothon in the lower reach must have been settled earlier than Khon Kaen in the upper reach. And population pressure must have reached a critical level earlier in the former than the latter.

Because of these different conditions, a somewhat different picture of the food/population balance is expected in Yasothon. A different picture there, however, will not necessarily invalidate the DD findings. What must be examined is whether the situation in Yasothon can be understood within the theoretical framework developed through the DD study.

## **I Changwat Yasothon and Amphoe Kham Khuan Kaeo**

The three villages studied are in Amphoe Kham Khuan Kaeo, Changwat Yasothon. Their general conditions are described below.

### *Changwat Yasothon*

Yasothon is one of the 17 *changwat* in Northeast Thailand as of 1989 (Fig. 1). Its area is 4,124 sq. km and its total population in 1985 was 485,495 persons, the population density being 118 persons/sq. km. The *changwat* is divided into eight *amphoe*, of which Amphoe Kham Khuan Kaeo is one. But for two to three thousand Phu Thai-speakers and one thousand Yo-speakers in the northern part, the people of this *changwat* are Lao-speaking. Glutinous rice is the preferred staple in the rural areas.

A local chronology compiled by Term Vipakayapojanakija [1987] gives some idea about the early settlement of the locality.

In 1771 (B.E. 2314), the ruler of Muang Nong Bua Lum Phu (now an *amphoe* in Changwat Udon Thani) had a quarrel with the King of Vientiane. Subsequently he sent for his relatives and followers to establish a new town on the Chi River at Ban Sing Tha, the site of the present town of Yasothon. After the destruction of Muang Nong Bua Lum Phu in 1776 (B.E. 2319), the ruler and his court moved to Ban Don Mot Daeng, the site of present Ubon Ratchathani, which is ca. 100 km downstream of Yasothon on the Chi River. Since

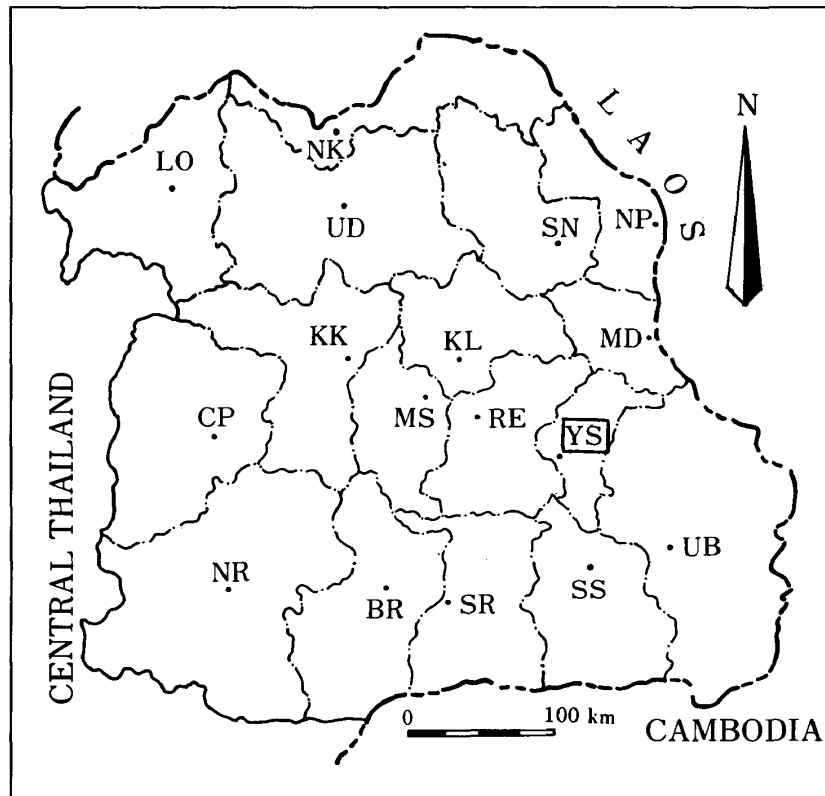


Fig. 1 *Changwat* in Northeast Thailand

BR; Buri Ram	CP; Chaiphum	KK; Khon Kaen
KL; Kalasin	LO; Loei	MS; Maha Sarakham
MD; Mukdahan	NK; Nong Khai	NP; Nakhon Phanom
NR; Nakhon Ratchasima	RE; Roi Et	SN; Sakon Nakhon
SR; Surin	SS; Si Sa Ket	UB; Ubon Ratchathani
UD; Udon Thani	<b>YS; Yasothon</b>	

they needed the support of Thon Buri, one of the strongest kingdom at that time, they sent tribute to it. When Ban Don Mot Daeng was attacked by Vientiane, Thon Buri sent an army to protect the town, but it arrived too late. Ban Don Mot Daeng had been destroyed. The Siamese army proceeded further to conquer Champasak and, finally, Vientiane in 1778 (B.E. 2321). The whole Kingdom of Srisattana Kanahut (the Laotian Kingdom) became a tributary state of the Kingdom of Siam.

Under Siamese domination, Ubon Ratchathani was established in 1791 (B.E. 2334). Prior to that, some members of the ruling family there had moved to Ban Sing Tha. The status of Ban Sing Tha was raised to Muang Yot Sunthon (an old name for Muang Yasothon) in 1814 (B.E. 2357). In 1913 (B.E. 2456), under the administrative reform carried out by King Rama V, Yasothon became part of Monthon Ubon Ratchathani. Later Ubon Ratchathani became a *changwat*, and Yasothon remained as one of its *amphoe* till it was declared as a separate *changwat* in 1972 (B.E. 2515).

### *The Town of Yasothon*

The town of Yasothon is the seat of the *changwat* office with 20,989 residents in 1986, corresponding to ca. 4.3 percent of total *changwat* population. The town is one of the smallest *changwat* towns in the whole country. The following is a sketch of the town in 1989.

The town had one first-class hotel, one second-class, and one third-class, and two motor-ins. The first class hotel opened in 1989 and had a restaurant-cum-bar with a live band. Entertainment was limited, there being only one movie theater, with two shows a day (the only theater in the whole *changwat*), two tennis courts, two billiard clubs, one computer-game center, one badminton court, and two book rental shops. Movies, however, were often shown under the moon and stars. There were about a dozen restaurants serving a variety of Thai-Chinese dishes, one shop specializing in rice-soup, *khao tom*, three in noodles, and five in Isaan food. Two roadside stalls also served food and there were two bakeries. There were six banks, one governmental and the others commercial. Two shops dealt in gold and jewelry. Two shops, called "supermarkets," sold daily necessities. There were two camera shops with D.P.E. service. Dealers in Japanese cars and motorcycles operated branch offices and garages, and there were several other small garages. Two rather large shops sold a wide range of electric appliances, beside several smaller ones. There were two stationery shops and one printing house.

There were two hospitals, one governmental and the other private, several small clinics and two pharmacies. Cosmetics were sold in two shops. The only high school in the *amphoe* was in the town. One of the two technical colleges in the *changwat* was near the town, the other, the Agricultural College, being in Amphoe Maha Chanachai.

Just outside the town, there was one canning factory with fewer than 100 employees, which seemed to be the only sizable factory in or around the town. There was neither taxi cab nor motorized tricycle in the town, though a small number of the latter were seen in some other *amphoe*. In the town, man-powered tricycles, *sam loh*, were used.

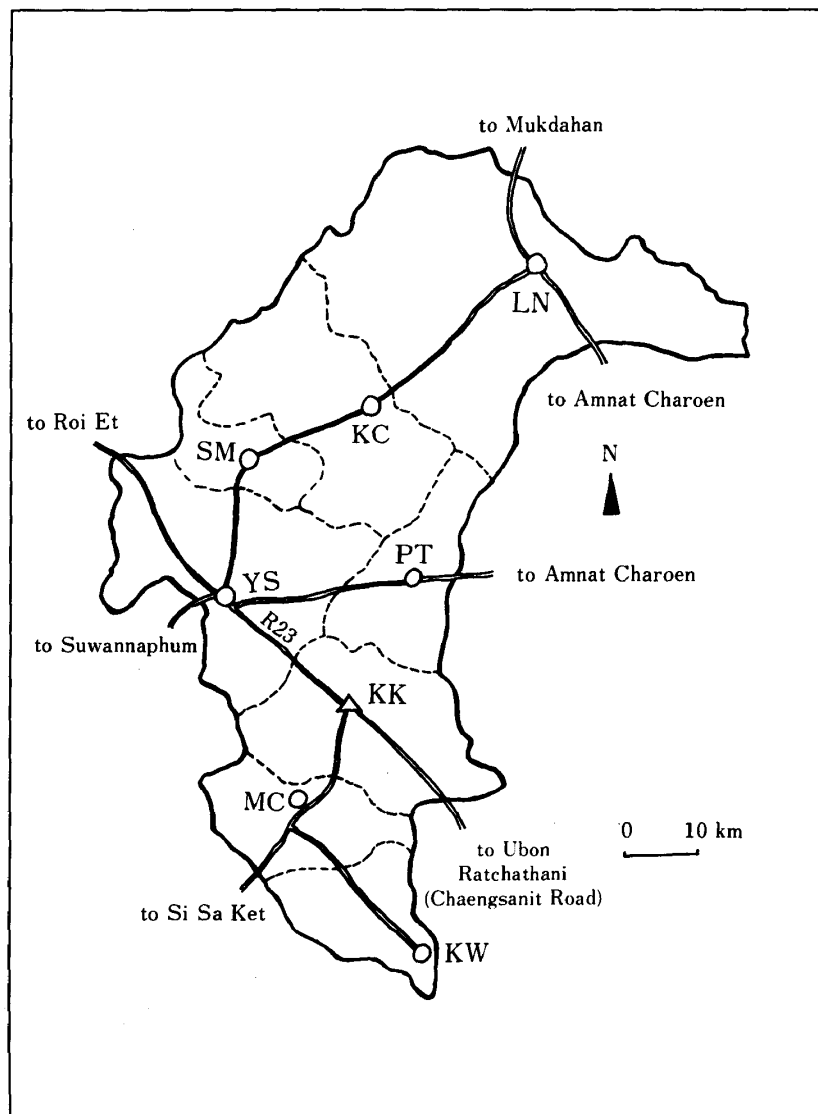
The above brief sketch of the town should suffice to indicate the very limited opportunities for off-farm employment in the town as well as in the *changwat*. Demand by the town people for local produce such as vegetables and fruits must also have been very limited. Local conditions of villages in this *changwat* were quite different from those of DD.

### *Amphoe Kham Khuan Kaeo*

According to National Statistical Office, 67,385 persons registered as residents of this *amphoe* in 1986. Its center is the small town of Lumphuk, consisting of two administrative units, i.e., *muban*. This town is the only *sukhaphiban* (sanitary district) in the *amphoe*. It is 20 km from the town of Yasothon on the Chaengsanit Road (Highway Number 23) to Ubon Ratchathani, which is 80 km further away. A surfaced road branches off the Chaengsanit Road at Lumphuk to the south leading to another *changwat*, Si Sa Ket. There were 12

*tambon* and 91 *muban* in this *amphoe* in 1989.

Two *amphoe* were established in Muang Yasothon in 1910: Amphoe Uthai Yasothon and Amphoe Pajim Yasothon. Lumphuk was the seat of the former, while the latter's was the present town of Yasothon. In 1913, Muang Yasothon was abolished and both of its *amphoe* became part of Monthon Ubon Ratchathani under the new names of Amphoe Kham Khuan Kaeo and Amphoe Yasothon, respectively. In 1917, the name of the former was changed again to Amphoe Lumphuk. From 1953, however, it was called by the former



**Fig. 2** *Amphoe* and Major Roads in Yasothon

KC; Kut Chum	KK; Kham Khuan Kaeo	KW; Kho Wang
LN; Loeng Nok Tha	MC; Maha Chana Chai	PT; Pa Tiu
SM; Sai Mun	YS; Amphoe Muang Yasothon	



name again, i.e., Amphoe Kham Khuan Kaeo. This name did not change when it became one of the *amphoe* of newly established Changwat Yasothon in 1972 [Thailand 1986].

In 1986 the town of Lumphuk reported 5,597 residents in 1,044 households, of which 520 were farm households. The government institutions located there included an *amphoe* office, a small hospital, the only high school in the *amphoe*, a library and other minor offices.

Lumphuk had one gasoline station and one cassava factory, the only factory in the *amphoe*. The only all-day market in the *amphoe* was also in this town. Around the market, there were a few noodle and food shops and some stalls selling take-home foods such as side dishes, steamed glutinous rice, fried rice and so on. Ice-cream and ice-cakes were also sold at some stalls. Along the main road, a restaurant served a variety of Thai food, mainly to employees of the government agencies.

The only camera shop in the *amphoe* was in Lumphuk, and it also offered a copying service, the only place to do so in the whole *amphoe*. A billiard hall was the only entertainment facility. There was neither hotel nor inn of any kind in this *amphoe*. No tricycle was seen either.

The second largest concentration of residents in Amphoe Kham Khuan Kaeo after Lumphuk is Dong Khaen Yai, 13 km further along the Chaengsanit Road to Ubon Ratchathani. It consists of four *muban*. This place is famous among travelers along this trunk road for its many shops and stalls selling grilled chicken, *kai yaang*, and papaya salad, *som tam*. Chickens are raised in the nearby villages. About 4 km further along the same road is an experimental station of animal husbandry, where a dozen or so villagers are employed.

Obviously, there is very limited demand for agricultural produce or off-farm labor within the *amphoe*. The same can be said about the whole *changwat*. Demand comes mainly from the outside the *changwat* and outside the country: kenaf, cassava and, more recently, rice, and employment in Bangkok. Temporary jobs abroad are not common in this *amphoe*.

The only non-farm product for which there is some demand may be handicraft products. In some villages in Amphoe Muang, various bamboo products are made. Triangular pillows, famous in this *changwat*, are made in some villages in Amphoe Pa Tiu. Amphoe Loeng Nok Tha is known for weaving. In Amphoe Kham Khuan Kaeo, however, handicraft products are mainly for the villagers' own use.

## II Land and Landuse

### *Changwat Yasothon*

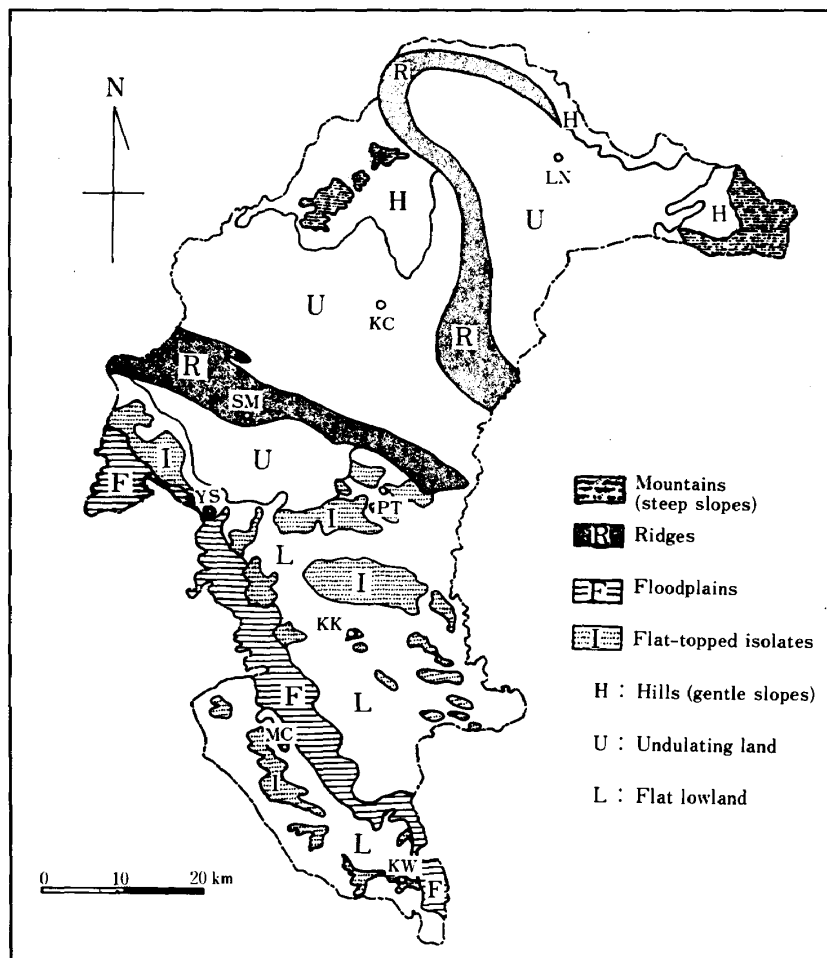
The Phu Phan Range runs east-west through the middle of the Northeast and separates the Khorat Plateau into two basins: the Sakon Nakhon Basin, which occupies the northern part, and the Khorat Basin, the southern part of the plateau. Changwat Yasothon spreads from the southern foothills of the Phu Phan Range toward the flat lowland in the center of the

Khorat Basin, including the floodplain of the Chi River, which drains the same basin. Between the foothills and the lowland lies an extensive area of undulating land.

The highest peak in the *changwat* is 472 m above MSL along the *changwat* border with Mukdahan. The undulating land is intersected by two ridges, one circular and the other elongated. Most of the undulating land lies 140 to 150 m above MSL, while the ridges are 160 to 200 m above MSL. The main part of the lowland is 120 m above MSL, but it is characterized by many isolated flat-topped hills, which are up to 20 m higher than the surrounding lowland. They differ in size, shape, soil, and the degree of dissection. Some of them are quite conspicuous.

Several tributary rivers originating from the Phu Phan Range flow north-south through the *changwat* and join the Chi River, which flows northwest-southeast in the southern periphery of the *changwat*.

The steep slopes of the foothill area are covered with forest while the gentle slopes

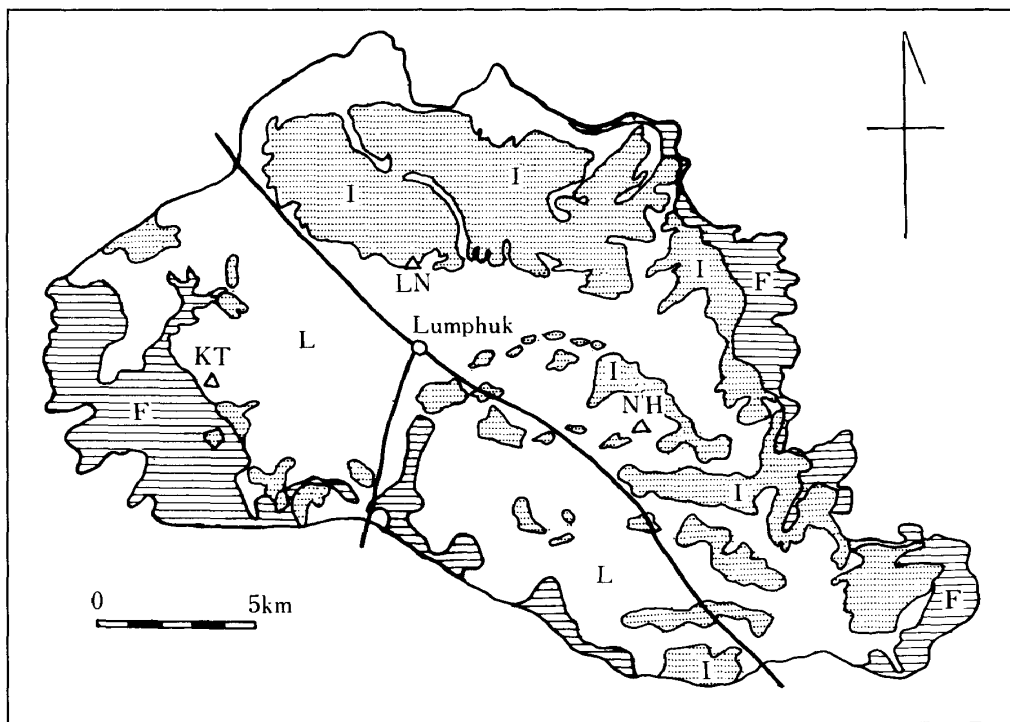


**Fig. 3** Physiography of Yasothon

The names of *amphoe* were abbreviated as in Fig. 2.

are planted to upland crops. Paddy fields are limited to the narrow valleys and their side slopes, which are terraced. In the undulating land, lowland rice and upland crops alternate according to the altitude and the soil texture. The paddy fields are characteristically dotted with numerous trees. The ridges are covered with poor wood stands or used for upland crop cultivation. The lowland is almost exclusively planted to rice. Here, the only trees are those planted around the fish ponds that are scattered through the riceland. The landuse of the flat-topped isolates varies from one to another: some are extensively reclaimed for upland farming or recently planted to eucalyptus, while others are covered with rather thick forest. The floodplain of the Chi River is rich in micro-relief. Some parts are used for rice while others are bushland. Flooding has become less frequent in recent years thanks to the construction of reservoirs upstream, but the risk remains.

About one half of the total area of the *changwat* is agricultural land, i.e., 206,707 ha (1,291,924 *rai*<sup>2</sup>) in 1985, the farm acreage per person being 2.66 *rai*/person. Paddylands occupy 90 percent of this. Of the paddy area, 52 percent is planted to glutinous rice and the rest to non-glutinous varieties. Kenaf and cassava are the most important upland crops



**Fig. 4** Physiography of Kham Khuan Kaeo with the Locations of the Three Sample Villages  
See Fig. 3 for legend.

2) One *rai* is 0.16 hectare, or 6.25 *rai* make one hectare.

in this *changwat*, as in the other *changwat* in the Khorat Plateau. Water melon in this *changwat* is well known but its acreage is limited. This crop must be shifted to new plots every two to three years because of diseases. A small area is planted to sugarcane, which is sold to a factory in Amphoe Nikhom Khamsoi, Changwat Mukdahan. Recently, planting of cashew nuts and eucalyptus trees has been promoted by agro-industry companies. So far, several thousand *rai* have been planted.

#### *Amphoe Kham Khuan Kaeo*

The whole *amphoe* is in the flat lowland, of which the matrix is extensive flat rice fields. In places, there are flat-topped hills and floodplains.

The most conspicuous of the flat-topped hills extends east-west in the northern part of the *amphoe*. It consists of three continuous hills, locally called Dong Yai, Dong Maphrik and Dong Patong from east to west, which rise 163, 157 and 137 m above MSL, respectively. They are sometimes called Dong Yai collectively. A large part of the flat tops is supposed to be reserved forest but has actually been cultivated for quite some time by nearby villagers. The soils are mostly classified as the Yasothon series suitable for upland-farming [Chaengprai 1971]. Cassava and kenaf are the most common crops, with nearly equal shares.<sup>3)</sup> Paddy fields spread on the gentle slopes surrounding the hills and extend further toward the flat lowland. The tree-dotted paddy landscape, which is common elsewhere in the Khorat Plateau, is scarcely seen in the lowland. Some paddy plots are used for retting kenaf during the late rainy season. Salt spots are observed in places.

Villages surround Dong Yai, and a circumferential road around it passes through them. The close proximity of the villages to each other has resulted in a ring of nearly continuous settlement around Dong Yai. LN village, one of the three sample villages, is part of this. The steep slope of the hill is just behind the village, while in front of it paddy fields cover on the gentle slope near the village and the flat lowland further away.

In the middle part of the *amphoe* are many smaller isolated hills. They are only a few meters higher than the surrounding paddyland. Their spatial pattern suggests that they are the remnants of a single hill that has been severely dissected, and examination of the materials supports this. The remnant highs are covered with forest and often the sites of villages. They are called *pa hua rai plai na*. Paddyland dominates the scenery in terms of area, but the fields are somehow different from those in the lowland, being dotted with trees, which become more frequent toward the highs. The common trees are *sabaeng* or *yang noi* (*Dipterocarpus intricatus*) and *saad* (*D. obtusifolius*). The pattern of the tree density allows us to imagine the process of paddyland reclamation in the past.<sup>4)</sup> Some paddy fields near the highs are often left unplanted. This is because of lack of water due to their topographical position and the high permeability of the sandy soils on the highs. Salt spots

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3) The changes in landuse of the table lands in this *amphoe* were studied in detail [Kono, Sijapati and Takeda 1994].

are found here and there.

Villages are mostly on the highs, lying some distance away from each other, though houses are packed in a village. Some of the villages are very small. Elsewhere, we seldom saw such small villages. The village pattern as such might partly be explained by the omnipresence of sites suitable for settlement. But it might also be related to the low yield of rice due to the poor land conditions: the low yield necessitates a relatively large holding, and this, in turn, would make the distance from home to field great if a large village were formed or if villages were not dispersed. The second sample village, NH, is in this area.

The flat lowland proper extends in the central and western part of the *amphoe*. Rice is the only crop grown. The paddy fields are not dotted with trees, but there are many small fish ponds (*bo pla*) of less than 100 sq. m each, which are surrounded by useful trees, such as mango trees (*Mangifera indica*), palm trees, various kinds of bamboo (*phai pa* or *Bambusa arundinacea*, *phai sangphai*, etc. [Bunkoet 1985] ) and others. The moisture regime appears favorable here because it receives surface as well as subsurface discharge from the surrounding higher ground. The best paddylands in the *amphoe* are found in the lowland, the rice-bowl of the *amphoe*.

The floodplain of the Chi River is at the southern periphery of the *amphoe*, while that of Lam Sebai, a tributary of the Chi River flowing down from Loeng Nok Tha along the boundary with Changwat Ubon Ratchathani, lies on the western periphery of the *amphoe*. The term *floodplain* does not necessarily mean annual flooding, but indicates areas receiving fresh sedimentation by floods which recur frequently, if not every year. A reservoir was constructed on one of the major tributaries of the Chi in the 1950s, i.e., Ubonrat Dam at Nam Phong in Khon Kaen. Plain-wide flooding has not taken place since then except for 1978. The 1978 flood is also known in DD. It was reportedly caused by the sudden release of a huge volume of water from the dam.

The floodplains of the Chi is rimmed by slightly raised ground, which is partly natural levees and partly the flat-topped low hills only a few meters higher than the surroundings. On this raised ground are located villages of elongated shape and some upland. Jute, not kenaf, is grown there. Some villages are located in the middle of the floodplain. The floodplain proper is rich in micro-relief and scattered with trees and bushes. *Sakae* (*Combretum quadrangulare*) and *tom* or *kratum* (*Anthocephalus cadamba*) are common species. The former is suited to charcoal making. There are also some abandoned paddy plots in the floodplain.

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- 4) The reasons why trees are left standing are often discussed; e.g. Grandstaff *et al.* [1986]. It is reported, for example, that farmers recognize the fertilizing effect of falling leaves [Patma Vityakon *et al.* 1988]. Their use as firewood or even timber might be another reason. They also give good shade for men and animals who work under the tropical sun. Throughout all these arguments, it is assumed that crop fields should be tree-less, and, if not, there should be a certain purposeful reason for it. However, it is possible that early settlers saved their labor by cutting down trees only to the extent that the remaining ones would not affect the rice crop adversely. If this is the case, the right question to be asked should be why all trees have been cut down elsewhere rather than why they have not in the Northeast.

In 1989, pumps installed on the bank of the Chi River started operation. Through pipelines a few kilometers long, the water reached some villages including KT village, one of the three villages studied, where a pipeline supplied water to two open ditches. It was observed in the rainy season of that year that the ditches were so poorly constructed that most water was lost on the way.

### III The Sample Villages and the Method of Interview

As stated previously, there are three landscape elements, flat lowland, flat-topped isolates and floodplain, in Amphoe Kham Khuan Kaeo. The sample villages were chosen in such a way that each represented one of them. A preliminary survey was carried out in which 3 to 4 villages in each landscape elements were visited and *ad hoc* interviews were made. Finally, 3 out of the 15 villages were selected. They are:

- (1) NH, in the dissected flat-topped isolates
- (2) LN, whose farming area extends over one of the most conspicuous flat-topped isolates, and flat lowland, and
- (3) KT, village on the floodplain of the Chi River.

#### *A Sketch of the Sample Villages*

##### *NH Village*

This village belongs to Tambon Na Kham. Nine kilometers east of Lumphuk along the Chaengsanit Road, at Na Thom village, a dirt road runs north for two kilometers to NH.

According to the village elders, this village was first settled by people from the old Pak Haed village, which was about two kilometers northeast of NH. Reclamation of new lands was their motive. Around 1880, a plague in Pak Haed caused many deaths. Many villagers dispersed to neighboring villages including NH, Hua Khua and Na Kham, and the rest created a new village with the same name, i.e., Pak Haed. The old Pak Haed was abandoned.

It is known that the first emigrants from NH were five families who moved to a neighboring village, Nong Saeng, in 1889. Rural-rural migration to a distant destination started later: five families moved to Kut Pla Duk in Amphoe Amnat Charoen<sup>5)</sup> in Changwat Ubon Ratchathani in 1919, two to Nong Khae in Amphoe Pa Tiu of Changwat Yasothon in 1954, and five to Amphoe Wanorn Niwat of Changwat Sakon Nakhon in the same year. The latest cases were two families to Changwat Buriram and one to Changwat Kamphaeng

5) Amphoe Amnat Charoen now became a separate *changwat*.

6) The spontaneous migration of a small group of farmers in search of lands in frontier areas is called *ha na di* in DD, but the term is not common in Yasothon though it is understood there.

Phet in 1958.<sup>6)</sup>

In 1989, the village population was 1,224 persons in 176 households. Almost all of them cultivated rice. The village's total farm area was 3,325 *rai*, an average of 2.72 *rai*/person or 18.89 *rai*/household. Many villagers left the village for off-farm jobs in Bangkok, the men commonly working as taxi drivers or restaurant employees and the women as housemaids or seamstresses.

#### *LN Village*

This village is at the foot of the flat-topped hill. It is three kilometers north of Lumphuk. The village elders told us that settlement started shortly after that of Lumphuk, some time before 1857.

The first case of rural-rural emigration remembered was in 1909, which involved 4 families who moved to Amphoe Loeng Nok Tha in the same *changwat*. In 1929, a large group consisting of 20 families migrated to Phak Ka Ya in Amphoe Kut Chum, Yasothon. In 1939, a group as large as the last one moved out to Amphoe Mei Wadi in Changwat Roi Et. In 1960, one family each migrated to Hua Ngua in Amphoe Kut Chum, Yasothon and to Amphoe Bung Kan in Changwat Nong Khai. Since then, there has been no emigration.

As of 1989, the village population was 920 persons in 175 households. Almost all of them were engaged in both rice and upland farming. The total area of paddyland was approximately 1,800 *rai* and that of upland about one half of this. The paddyland/population ratio was 1.96 *rai*/person or 10.29 *rai*/household, substantially smaller than that in NH. The major crop in the upland was kenaf, with about 150 households engaged in its cultivation and post-harvest processing, while 60 households engaged in cultivation of cassava. The combination of rice and upland crops offers the opportunity for farm work throughout the year. This probably accounts for the smaller number of temporary migrants to Bangkok from this village.

#### *KT Village*

This village is seven kilometers southwest of Lumphuk and can be reached by a dirt road from there. Two more dirt roads branching off the Chaengsanit Road between the town of Yasothon and Lumphuk also reach the village.

The village stands on slightly elevated ground separating the floodplain to the south and the flat paddylands to the north. The latter mostly belong to neighboring villages. Most of KT villagers' paddylands are in the floodplain, where ponds of various sizes are seen. Some of these ponds do not dry up even during the dry season. Until 1984, small amounts of dry-season rice were grown there, about one *rai* or so per household, to supplement the main-season rice. Both crops were for home consumption. With abandonment of off-season rice, hired tractors began reclaiming these marshy lands.

The pioneers of this village came from one of its neighboring villages in 1897, i.e., Song Pluai, only one and a half kilometers away. A year later, one family arrived from

Amphoe Khuang Nai and another from Amphoe Hua Taphan in Changwat Ubon Ratchathani. Subsequently, many people immigrated to this village, which was well known as a place of abundant fish and virgin land, if flood-prone. Some came from as far away as Amphoe Khuang Nai in Changwat Ubon Ratchathani, while others from nearby villages such as Dong, Phon Than and LN.

While immigration continued, some people emigrated. In as early as 1929, 2 families moved out to Phak Ka Ya in Amphoe Kut Chum, Yasothon, followed by 12 families who migrated to Kut Sim in Amphoe Non Sang, Changwat Udon Thani in 1933. Emigration continued until recently: 6 families moved to Na Sabaeng in Amphoe Nong Han, Changwat Udon Thani in 1969 and 5 to Kham Phak Nam in Amphoe Kut Chum, Yasothon.

As of 1989, there were 505 residents in 87 households with 1,716 *rai* of paddylands, an average of 3.40 *rai*/person or 19.72 *rai*/household.

#### *The Method of Interview*

From each of the three villages, ten households were chosen by random sampling. The head of each sample household or his spouse was interviewed on his/her family history, changes in farm area, off-farm employment and others. Based on this, a genealogical chart was first constructed up to the interviewee's grandparents' generation.

Next, those appearing in the chart, whose livelihood depended at least in part on land presently cultivated by the interviewee's household were listed in a table by their age in each year that they depended on that land. The paddy acreage supporting them was also included in the table. In many cases, a tract of land presently cultivated by an interviewee had been part of a larger tract owned by his/her parents. In these cases, the parents and their children together with the acreage of the larger tract were recorded for the years prior to the division of land by inheritance, while only members of the present household with the smaller acreage were recorded for subsequent years. Also tabulated were the numbers of people who migrated permanently and who left the village for temporary off-farm employment. The latter was indicated in terms of person-months.

It should be noted that the persons listed in the ten tables thus constructed for each village include only those who depended on a particular tract of paddyland that was cultivated in whole or in part by a sample household at the time of interview. Therefore, the sum of neither acreage nor the number of persons in the tables for a village is proportional to the total acreage or population of that village. Only the ratio of the two for a particular year is meaningful. For the same reason, occurrences of migration and off-village employment must be expressed as percentages of the total number of persons listed in the tables.



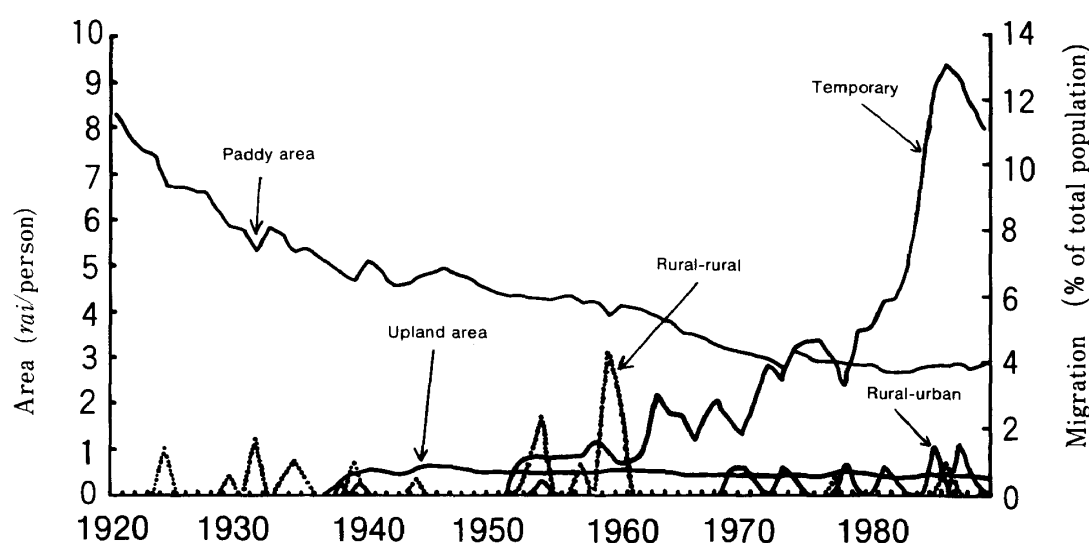
#### IV Results and Discussions

##### *The General Trend*

Firstly, the data of the 30 households in the three villages are pooled together and discussed below.

Fig. 5 shows the changes over time of the farm area per person together with the migration, permanent and temporary, since the 1920s. The per capita paddy area declined from 8 to 3 *rai*/person, the rate being approximately one *rai* in ten years. This decline ceased before the 1960s, since when a level of about 3 *rai*/person had been maintained. The figure of 8 *rai* of paddyland per person in the 1920s appears to be unrealistic considering that little, if any, surplus was produced under largely subsistence economy at that time. Even when a lower and less stable yield than today is assumed, the area appears to be too large for self-sufficiency in rice. Furthermore, such a large area could not have been cultivated without machinery or hired labor.

According to the DD study, 2.5 *rai* per person is enough for self-sufficiency in rice, and the maximum manageable area per unit labor force approximately 5 *rai*.<sup>7)</sup> In DD, the early settlers acquired self-declared land ownership not necessarily by actual reclamation but simply by demarcating a tract of land, which was recognized among themselves. Such



**Fig. 5** Farm Acreage per Person and Migration in the Three Villages (Pooled)  
Based on the pooled data on 30 households in the three villages.

7) For detailed discussion on the maximum cultivable acreage by unit labor force under rain-fed conditions, see Fukui [1993: Chap. 6, Section 3].

is the reality of so-called *chap chong*. Land thus acquired would be reclaimed step by step as the number of mouths to be fed and the availability of family labor increased. If such was also the case in the sample villages under discussion, the per capita area reported for the early years probably means the area of which ownership was recognized, of which only part was actually cultivated.<sup>8)</sup>

The general trend of permanent emigration indicates several interesting features. Most evident of them is a drastic change in destination, i.e., from rural areas before the 1970s to urban areas thereafter. Also, Fig. 5 indicates that: in terms of the percentage of emigrants in the village population, rural emigration peaked around 1960, while urban emigration started in the late 1960s. The percentage of urban migrants in any given year was small but constant, while that of rural emigrants was highly irregular and showed peaks as high as four percent in some years. This reflects a difference in the mode of migration: a whole family or a group of families headed out for the frontier lands, while single persons or young and small families emigrated to Bangkok.

Of the rural-rural migrants, many of the earlier ones moved to distant places in other *changwat*, while the recent ones moved within the *changwat*. This reflects changes in the economic structure: under the subsistence economy that prevailed in earlier times, rice-farming was the only means of livelihood and land suitable for this could not be found nearby; but when upland farming later became a viable alternative, it was no longer necessary to leave the *changwat* to find suitable land.

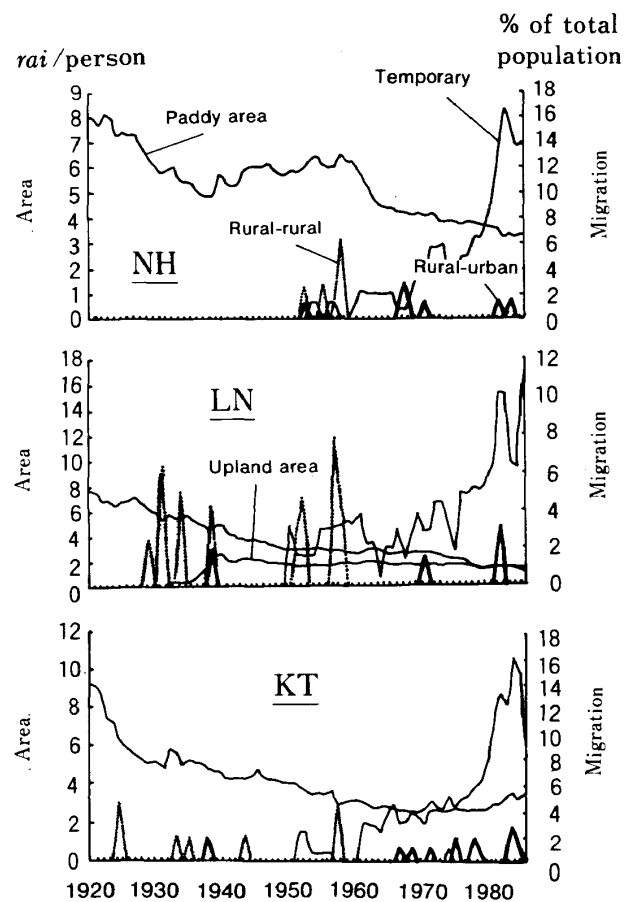
Apart from the permanent emigration, numerous people left the villages for temporary jobs in towns, particularly in Bangkok. A small peak in the 1930s reflects the seasonal employment as farm laborers in the Central Plain. Temporary work in towns started as early as the 1950s, and increased nearly exponentially thereafter. In 1989, it reached 13 percent of the total person-months of the village labor force.

#### *A Comparison of the Three Villages*

Fig. 6 shows the changes in farm area and migration in the three villages separately. The declining pattern of paddy area differs between them in (a) when the decline ceased, and (b) the acreage at the bottom level thereafter. In LN and KT, the area declined earlier, became about 3 *rai*/person as early as the early 1960s, and remained at that level till the late 1970s. Thereafter, it declined further to the level of merely 1.5 *rai*/person in LN, while in KT it remained at the same level or even recovered slightly. In NH, it maintained a relatively high level of over 4 *rai*/person until the 1970s and declined to the level of 3 *rai*/person only in the 1980s. As discussed earlier, the per capita paddy area might not necessarily reflect the area actually planted to rice. Therefore, the time when it reached the bottom should be taken as the time when unreclaimed land suitable for rice was exhausted.

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8) Nearly 10 *rai* per unit labor force in the 1920s in a village near Khon Kaen is reported by Lefferts [1974].



**Fig. 6** Farm Acreage per Person and Migration in NH, LN, and KT  
Based on 10 households each in a village.

This occurred in LN and KT in the early 1960s and in NH about a decade later.

In KT, a village in the floodplain, the situation is somewhat complicated. As stated above, virgin land apparently became exhausted in the early 1960s. Actually, however, reclamation was being undertaken in the late 1980s. This can be explained, first, by the decreased vulnerability to flooding thanks to the dams upstream and, second, by a new incentive to produce a surplus. The changes in per capita area in NH and LN after the late 1970s must be discussed in light of the new technology and commercialization of rice.

In interpreting the inter-village differences in per capita paddy area after the exhaustion of virgin land, the land productivity must be taken into account. Fig. 7 shows the production data of the three villages for 1985-1989. In LN, the per capita area was less than 1.5 *rai*/person but nearly 90 percent of it was actually planted, and the yield was highest among the three, averaging 434 kg paddy/*rai*. As a result, 500-600 kg of paddy/person was produced. In the other two villages, the area was large (ca. 2.5 *rai*/person) but only 65-85 percent of it was planted and the yield was only half of that in

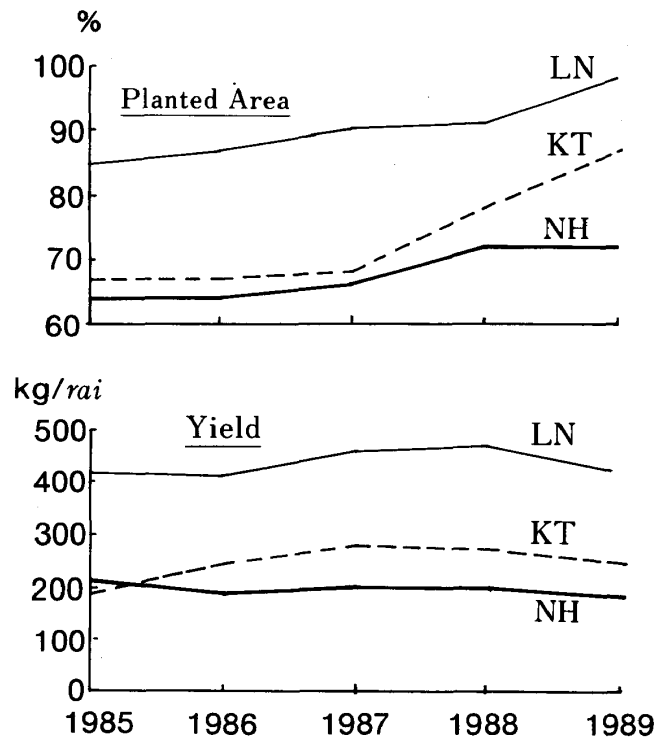


Fig. 7 Planted Area and Yield of Paddy in Three Villages

LN, averaging 248 and 200 kg/rai in KT and NH, respectively. As a result, the difference between LN and the other two villages in per capita rice supply was not as large as the per capita area might suggest. The inter-village differences in productivity can largely be attributed to those in the land conditions, among which relief, moisture and soil fertility are most important.

As stated earlier, rice-farming in this *changwat* saw a drastic change between the late 1970s and the early 1980s. The three sample villages were no exception to this, and their yields before that must, therefore, have been much lower than those cited above. Notwithstanding this, we can assume that all of the villages must have been nearly self-sufficient in rice, if not producing surplus, even before the change, since the basic requirement of rice is said to be 300 kg paddy per head and the supply in the late 1980s was nearly twice as large.<sup>9)</sup>

It can be concluded that the three villages did not significantly differ from each other in terms of per capita rice supply before commercial production started in the late 1970s. It appears that they neither produced a large surplus nor suffered from a constant shortage of rice, though they must certainly have suffered in unfavorable years.

The differences among the villages are more evident in the time of the exhaustion of virgin land. This occurred earliest in LN, which is endowed with the best land and, for

9) For the actual rice consumption per person in NH, see Nakada [1995].

that reason, was founded as early as the settlement of Lump huk, the seat of the *amphoe*. NH is also an old village, but its inferior land conditions appear to have attracted fewer pioneers. Paddyland could be extended within the village vicinity till later. In KT, the paddylands were prone to flooding till recently, which appears to be primarily responsible for its relatively recent foundation. Here, the land reclamation proceeded in two steps, the first till the early 1960s and the second in the 1980s.

It is interesting to note that the reclamation of uplands in LN appears to have least effected the rice/population ratio over time. The small per capita paddy area in this village is a consequence of the high productivity of rice rather than the supplementary role of upland farming. It appears that little of the cash earned by selling kenaf or cassava was spent on rice.

Rural-rural migration started earliest and was most frequent in LN, followed by KT, while it was latest and least frequent in NH. Evidently this is closely related to the exhaustion of virgin lands.

The trend of rural-urban migration is quite different from that of rural-rural migration. It was most frequent in KT followed by NH, and least frequent in LN. The percentages of temporary out-of-village employment closely parallel to those of rural-urban migration: high in KT and NH and low in LN. This suggests that the permanent as well as temporary rural-urban migration is not related to the rice/population balance.

Rural-urban migration simply reduces the village population and thus brings about a more favorable rice/population balance, while temporary leave, though it might also have the same effect at least temporarily, also brings in cash, which is badly needed to maintain today's village lifestyle.<sup>10)</sup> It is considered, therefore, that the cash from the sale of upland crops obviated the need for villagers to seek out-of-village jobs in LN. The low percentage of permanent rural-urban migration in LN, however, can be explained by neither this nor the per capita rice supply.

It is highly unlikely that a newcomer to a town with no prior experience of temporary employment there will get a good permanent job. Normally, he/she finds a temporary job first and works some time. Some of them might eventually land a permanent job and/or get married, and only then, will they move their base to town. If such were common process of rural-urban migration, it would naturally result in a parallelism between the temporary and permanent migrations to town. Thus, the high percentages of out-of-village temporary employment in NH and KT are considered primarily responsible for the high percentages of permanent migration to Bangkok, while in LN there was less chance of permanent migration since fewer villagers left for temporary jobs.

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10) The effect of the seasonal migration for out-of-village jobs upon the rice/population balance was studied in detail by one of the authors [Nakada 1995].

## V A Summary Discussion in Comparison to the DD Findings

The per capita paddy area actually cultivated in DD little changed from the 1930s till the early 1980s, being 2.5 *rai*/person. The same can also be said of the sample villages in Yasothon, though the acreage itself might differ depending on the land productivity. Until the impact of the economic development that began in the 1960s reached rural areas, this level had been maintained by either (a) the reclamation of virgin lands within the vicinity of a village and/or (b) the rural-rural emigration to frontier areas.

In DD, the areal expansion of paddyland ceased in the early 1950s, while rural-rural emigration continued from the 1940s through the 1960s. In the three villages in Yasothon, too, though it is not exactly known when the potential paddyland was exhausted, the within-village reclamation and rural-rural migration probably proceeded concurrently for a while.

Vigorous efforts towards development with emphasis on the Northeast from the late 1950s brought about significant changes in the rural areas there. Improved roads and increased job opportunities in urban areas resulted in shift of the destination of emigrants from the frontier to Bangkok. Certainly, emigration to Bangkok, whether temporary or permanent, helped maintain the self-sufficiency in rice to some extent, but it appears to have been motivated more by the need for cash income than by population pressure. The development also changed the rural lifestyle so that cash became indispensable. The less frequent migration from the village producing cash crops proves this.

In DD, the mortality rate continued to decline from the 1930s while the birth rate maintained a high level till the introduction of contraceptives in the late 1960s, which resulted in a sudden and significant decline in the rate of population increase. The demographic trend of DD resembles that of the whole country. If the same can be assumed for the sample villages, the slower rate of population increase from the 1970s might have mitigated the effects of population pressure. Thus, self-sufficiency in rice could have been maintained by rural-urban migration which was motivated primarily by cash income.

The follow-up survey of DD in the latter half of the 1980s indicates that the village is no more self-sufficient in rice because of the increase in its non-farming population. Due to the proximity to Khon Kaen city, DD is becoming a suburban village. Such has not yet occurred in Yasothon, where out-of-village jobs are very limited within the *changwat*. Instead, a quite different phenomenon appeared there from the late 1970s, that is, the commercial production of rice under rain-fed conditions. Such was not observed in DD. The more favorable rainfall in Yasothon appears to be one of the prerequisites of surplus production.

No fundamental difference was discovered between Khon Kaen and Yasothon in the reaction of villagers to increasing population in the changing socio-economic environment. While the village economy was basically one of subsistence, villagers reacted by simply

expanding their subsistence rice farming either within the village or in frontier areas. When the modern way of life penetrated into the villages, many villagers began to earn cash income, either from cash crops where this was possible or by out-of-village employment. The latter eventually resulted in the permanent emigration of some of the temporary urban workers, which helped maintain the self-sufficiency in rice in villages. Its effect, however, should not be exaggerated, since the rate of population growth probably declined during the same period.

The maintenance of self-sufficiency in rice in a basically subsistence economy requires no explanation. Its continued maintenance at a time when cash income had become very important, however, might need some. We see in it the persistence of the villagers' preference for an assured livelihood based on self-produced staple food, no matter how small its share in their household revenue might be. To be a landed peasant with sufficient, if not surplus, rice supplemented by cash income is an ideal that, so far, the majority of villagers have been able to realize.

It is also true that differences exist between DD and the three villages in Kham Khuan Kaeo. These differences, however, can be attributed to the length of village history, the land conditions, rainfall, availability of off-farm employment and so on, and do not appear to have resulted in a fundamentally different reaction to increasing population.

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